

Rider Education Report

Fuel Part 1

Rider education is more than just learning and practicing tips and techniques on how to handle your motorcycle to keep yourself and others safe. It is also about learning how to maintain your health and the health of your motorcycle. One of the many things that is required for good health is a fresh supply of fuel.

By definition, a fuel is:

- 1) A combustible matter used to maintain a fire to create heat or power
- 2) Something that gives nourishment
- 3) An energy source for engines, power plants, or reactors
- 4) Something that sustains or encourages

The riders and co-riders of motorcycles, most of whom are human, have varying tastes and needs when it comes to fuel to keep them healthy. But they all share one thing in common, the need for water. The adult human body is in fact up to 60% water. While not a fuel per se, water is consumed by the body and needs to be replenished on a regular basis. Fortunately, modern society provides a plethora of different sources of clean water for human consumption.

Most motorcycles produced today still use gasoline for fuel. Gasoline is a petroleum-derived product comprising a mixture of liquid aliphatic and aromatic hydrocarbons, ranging between C4 and C12 carbon atoms with the boiling range of 30–225°C. It is predominantly a mixture of paraffins, naphthene, aromatics and olefins. Originally gasoline was known as a byproduct of the production of kerosene and discarded by burning or dumping as waste. With the advent of the automobile, gasoline became valuable, and by 1911, more gasoline than kerosene was sold.

Today we have three main grades of gasoline typically available at retail fuel stations: regular, midgrade, and premium. The difference between the grades of gasoline is the octane rating. This rating is an indication of how well the fuel will resist spontaneous combustion inside the cylinder, also known as pre-ignition or engine knock. Some companies have different names for these grades of gasoline, like regular, unleaded, mid-grade, medium, super, premium, or super premium, but every grade will indicate the octane rating. The lowest octane rated gasoline is usually the least expensive, but that does not mean it is the best value. Vehicle manufacturers recommend the grade of gasoline for use in each model of their vehicles. Using a lower rated fuel risks engine damage, while using a higher rated fuel usually does not provide any additional performance.

In addition to the grade of motor gasoline, the formulation of gasoline may differ, depending on the location where it is sold or the season of the year. Federal and state air pollution control programs that aim to reduce carbon monoxide, smog, and air toxins require oxygenated, reformulated, and low-volatility gasoline. Some areas of the country are required to use specially formulated gasoline to reduce certain emissions, and the formulation may change during winter and summer months. These area-specific

requirements mean that gasoline is not the same everywhere. Gasoline produced for sale in one area of the United States might not be authorized for sale in another area.

The main difference between winter- and summer-grade gasoline is vapor pressure. Gasoline vapor pressure is important for an automobile engine to work properly. During winter months, vapor pressure must be high enough for the engine to start easily. In the summer, lower vapor pressure is required in many areas to reduce air pollution. Gasoline evaporates more easily in warm weather, releasing more volatile organic compounds that contribute to health problems and to ground-level ozone and smog. To cut down on pollution, the U.S. Environmental Protection Agency requires petroleum refiners to reduce the vapor pressure of gasoline during the summer.

Be sure to tune in next month for Fuel Part 2.

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